

REMARKS

The Notice of Non Compliant Amendment mailed on July 27, 2005 has been considered. Amendments to the Abstract have been placed on a separate sheet as suggested by the examiner. The remaining remarks which follow were originally submitted on July 12, 2005 with a 3 month extension.

The Office Action mailed on January 12, 2005 has been carefully considered and the Examiner's remarks are appreciated. Claims 1-24 were originally presented. Claims 10, 12, 22, and 24 have been canceled, and claims 9, 11, 21, and 23 have been amended. Therefore claims 1-9, 11, 13-21, and 23 are presented for examination, with support for the amendments found in the Specification, Claims, and Drawings. In response to the Office Action, Applicants respectfully request reconsideration of the rejected claims in view of the above amendments and the following remarks.

Discussion of Objections to the Drawings

In the Office Action, the Examiner objected to the drawings stating that the reference character "24" was used in paragraph [0022] of the Specification to designate both "dc power supply" and "pulse controller," and because the description does not mention reference characters 26, 33, 34, and 35. Paragraph [0022] has been amended accordingly such that "24" refers only to the dc power supply, and "26" refers to one of the pulse controllers as correctly shown in Figure 2. In addition, paragraph [0022] has been amended to describe 33, 34, and 35 as the sputtered target particles, substrate holder assembly, and

substrate, respectively, as shown and similarly described in Figure 1, for reference characters 17, 18, and 19.

Discussion of Objections to the Specification

The typographical error "ore" in line 2 of the Abstract has been corrected.

Discussion of Objections to the Claims

In the Office Action, the Examiner objected to claims 10, 12, 22, and 24 as being of improper dependent form. Applicants have incorporated the limitation in claims 10, 12, 22, and 24 into claims 9, 11, 21, and 23, respectively, which further limit the subject matter of a previous claim. Claims 10, 12, 22, and 24 are now canceled.

Discussion of Rejections under 35 USC §103(a)

In the Office Action, the Examiner rejected claims 1-9, 11, 13-21, and 23 under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,851,365 to Scobey (hereinafter "Scobey") in view of *Electrical Dynamics of Pulsed Plasmas* by Belkind et al (hereinafter "Belkind article"). In support of his rejections, the Examiner stated that Scobey discloses, inter alia, "means for providing a reactant gas 28," but does not disclose the power supply to the targets to be pulsed DC power. The Belkind article is used by the Examiner to supply this limitation, which the Examiner stated would have been obvious to combine because of the desire to prevent or reduce arcing when sputtering insulators. However, Applicants respectfully submit that the

rejections are inappropriate since the cited references do not teach or suggest all claim limitations as required by MPEP §2143.03 as follows in part:

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art"

Regarding the independent claims 1 and 13, one of the key limitations is the *"means for providing a reactant gas at said target source to form said sputtered particles"* (emphasis added) in claim 1, and *"impinging said target source with a reactant gas to sputter said particles onto said substrate."* In his comparison with Scobey, the Examiner failed to consider these key limitations of the present invention, stating only that Scobey also teaches a *"means for providing a reactant gas 28."* As discussed at length in the present application (see paragraph [0021]), the present invention enables the ionization of the reactant gas without the need for the separate ion gun due to the incorporation of pulsed DC power for the magnetron. Thus the reactant gas may be introduced into the magnetron and used alone (in one embodiment) to bombard the target to produce the sputtered particles. This greatly simplifies the size and operation of the present invention. In contrast, Scobey teaches providing an argon gas source to effect target bombardment, and a separate ion gun to direct a reactive gas directly at the substrate. Moreover, the reactive gas is not used to form the sputtered particles themselves; rather the reactive gas operates only to combine together with the sputtered particles at the substrate. And the absence of these key

substantive limitations in claims 1 and 13 is not corrected by combining with the Belkind article, which teaches the use of pulsed bias to reduce or eliminate arcing.

Applicants respectfully submit, therefore, that the use of the reactant gas at said target source to form the sputtered particles is not disclosed, taught, or suggested by either references, and therefore the 103-based rejections are inappropriate. Additionally, the rejections to claims 2-9, 11, 14-21, and 23 are also inappropriate as being dependent on an allowable claim.

With respect to the rejection of claims 7, 8, 19, and 20, Applicants respectfully submit that the inherency argument is inappropriate without a further basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic of the claimed limitations necessarily flows from the teachings of the applied prior art, as required by the Board of Patent Appeals in *Ex parte Levy*, 17 USPQ 2d 1461, 1464 (B.P.A.I. 1990).

Summary

Having amended the claims and/or overcome Examiner's rejections as discussed above, Applicant respectfully submits that claims 1-9, 11, 13-21, and 23 are in condition for allowance. Applicants respectfully request allowance of claims 1-9, 11, 13-21, and 23.

In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he is respectfully requested to initiate the same with the undersigned at (925) 422-7274.

Respectfully submitted,

Dated: August 25 , 2005

By: 

James S. Tak

Attorney for Applicant

Registration No. 46,367

Lawrence Livermore National Lab

7000 East Avenue, L-703

Livermore, CA 94550

TEL: (925) 422-7274

FAX: (925) 423-2231